

Amendments to the Claims

Listing of Claims:

Original Claims 1-11 (canceled).

Claim 12 (new). A method for adapting an injection valve characteristic, the injection valve characteristic representing a reference injection behavior, of a triggered fuel injection valve of an internal combustion engine to aging-related changes or manufacturing-related variations of an actual injection behavior, which comprises the steps of:

- a) during an operating state of the internal combustion engine, the operating state not requiring a fuel injection, triggering an injection valve intermittently in accordance with a trigger duration, while otherwise no fuel injection occurs, such that at least one work cycle with triggering follows or precedes at least one work cycle without triggering of the injection valve;
- b) detecting a rotational-speed value or a value of a rotational-speed-dependent variable of the internal combustion engine in each case for the work cycle with triggering and for at least one of the work cycles without triggering; and
- c) establishing a difference between detected values and a correction of the injection valve characteristic being effected thereupon.

Claim 13 (new). The method according to claim 12, which further comprises calculating derivatives of a first and/or higher order from the differences between the detected values.

Claim 14 (new). The method according to claim 13, which further comprises:

calculating the differences on a basis of measured segment times;

calculating difference quotients from the differences; and

deriving the derivatives of the first and higher order therefrom.

Claim 15 (new). The method according to claim 12, which further comprises:

analyzing an overall profile of the rotational-speed value or of the rotational-speed-dependent variable using signal-analysis methods over a plurality of the work cycles with and without triggering; and

identifying and eliminating interference effects.

Claim 16 (new). The method according to claim 12, which further comprises increasing the trigger duration step-by-step.

Claim 17 (new). The method according to claim 12, which further comprises during the establishing of the difference step, calculating an angular momentum value for an angular momentum which was produced by triggering of the injection valve with the trigger duration.

Claim 18 (new). The method according to claim 17, which further comprises calculating the angular momentum value in accordance with the following formula:

$$D = (\pi/F1) * M * (dN+ - dN-) + dJ,$$

where F1 is a factor that is dependent on a number of cylinders, D is the angular momentum value, M is a moment of inertia of the internal combustion engine, dN+ is a rotational-speed gradient of the work cycle with triggering of the injection valve, dN- is a rotational-speed gradient of one of the work cycles without triggering of the injection valve, and dJ is a factor for a braking moment which is caused by internal friction of the internal combustion engine.

Claim 19 (new). The method according to claim 12, which further comprises executing the steps a) and b) several times with an unchanged trigger duration for providing noise suppression.

Claim 20 (new). The method according to claim 17, which further comprises:

using a multi-cylinder internal combustion engine as the internal combustion engine;

sampling a segment wheel driven by the internal combustion engine;

executing a first work cycle without triggering of the injection valve of a specific cylinder, then a second work cycle with triggering of the injection valve of the specific cylinder, and then a third work cycle without triggering of the injection valve of the specific cylinder, wherein a segment time is specified in at least the first, second and third work cycle for the specific cylinder, the segment time lasting for a passage of a segment of the segment wheel during a working stroke of the specific cylinder; and

calculating the angular momentum in accordance with the following equation:

$$D = F2 * \pi * M ((Tx3 - Tx2)/(ST-)^3) - (Tx2 - Tx1)/(ST+)^3 + dJ,$$

where F2 is a factor that is dependent on a number of cylinders, D is the angular momentum value, M is a moment of inertia of the internal combustion engine, dJ is a factor for a braking moment which is caused by internal friction of the internal combustion engine, Tx1 is the segment time for the specific cylinder in the first work cycle, Tx2 is the segment time for the specific cylinder in the second work cycle, Tx3 is the segment time for the cylinder in the third work cycle, ST- is a average total duration of a passage of all segments during a work cycle without triggering of the injection valve and ST+ is an average total duration of a passage

of all segments during one of the work cycles with triggering of the injection valve.

Claim 21 (new). The method according to claim 18, which further comprises establishing a difference between two values for determining a factor for the braking moment which is caused by the internal friction of the internal combustion engine, wherein one value is assigned to one of the work cycles of the internal combustion engine without triggering of the injection valve and the other is assigned to the work cycle of the internal combustion engine with triggering of the work cycle.

Claim 22 (new). The method according to claim 17, which further comprises:

deriving a fuel-mass value for a fuel mass that is delivered by the injection valve from the angular momentum value;

assigning the fuel-mass value to the trigger duration and used for correcting the injection valve characteristic.